REMARKS

The above amendments to the above-captioned application along with the following remarks are being submitted as a full and complete response to the Office Action dated April 16, 2008. In view of the above amendments and the following remarks, the Examiner is respectfully requested to give due reconsideration to this application, to indicate the allowability of the claims, and to pass this case to issue.

Status of the Claims

As outlined above, claims 1, 3-5 and 7-22 stand for consideration in this application, wherein claims 1 and 21 are being amended to correct formal errors and to more particularly point out and distinctly claim the subject invention. A new claim 22 is being added. All amendments to the application are fully supported therein. Applicant hereby submits that no new matter is being introduced into the application through the submission of this response.

Formality Rejection

Claims 1 and 21 were objected to for informalities Since the claims are being amended as suggested by the Examiner, the withdrawal of the outstanding informality rejection is in order, and is therefore respectfully solicited.

Prior Art Rejections

Claims 1, 3-5, 7-13, 16 and 18-21 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Momoo et al. (US 6,741,538) in view of newly-cited Edmond et al. (US 5,592,501) and an article by Issiki et al., claim 14 was rejected further in view of Yoshida et al. (US 2002/0024153); claim 15 was rejected further in view of Hayashi (US 6,394,655); and claim 17 was rejected further in view of Brown (US 5,625,729). Applicant has reviewed the above-outlined prior art rejections, and hereby respectfully traverse.

The optical head of the present invention, as now recited in claim 1, comprises: a semiconductor laser for emitting a light beam, a lens for focusing the light beam onto a medium, and a detector for detecting a reflected light beam from the medium, said semiconductor laser comprising an active layer and a barrier layer. The active layer being formed of an ***indirect bandgap semiconductor*** in an asymmetric quantum structure (Figs. 6-7; pp. 21-23) in which a bandgap is defined between a quantum well of a conduction band 3 and an adjacent quantum well of a valence band 4, and each of the quantum wells has two walls which are asymmetric with respect to a center of the quantum well. The optical head

further comprises means for supplying a driving current for said semiconductor laser to stabilize a broadband oscillation (Fig. 10; p. 28, lines 7-27; p. 27, lines 26-28).

As recited in the new claim 22, said means for supplying a driving current is a laser driver that supplies the driving current above a threshold value of said broadband oscillation, and the driving current avoids excitation causing a single mode oscillation and a multimode oscillation (Figs. 2 & 10; p. 7, lines 9-13; p. 28, lines 4-7).

The supply means is a necessary for oscillating the indirect semiconductor laser in a condition that the emission spectrum is relatively broad and continuously gentle (p. 8, lines 19-20).

Applicants respectfully contend that cited references fail to teach or suggest (1) "indirect bandgap semiconductor laser in an optical head", and (2) "means for supplying a driving current for said semiconductor laser to stabilize a broadband oscillation in the optical head" of the present invention.

Regarding the (1) feature, As admitted by the Examiner (p. 3, lines 1-2 of the outstanding Office Action), Momoo does not disclose any indirect bandgap semiconductor laser in an optical head. Edmond was relied upon by the Examiner to provide the teaching. However, Edmond deliberately teaches away from the invention by avoiding using any indirect bandgap material but using direct bandgap material for direct bandgap semiconductor laser ("*in order to produce the laser effect (stimulated emission of radiation), the semiconductor must be a direct bandgap material rather than an indirect bandgap material.*" col. 1, lines 64-67; "*Silicon carbide has been demonstrated to produce excellent light-emitting diodes (LEDs) in the blue and ultraviolet (UV) range of the spectrum (and correspondingly photodetectors as well), but is an indirect bandgap material, and thus although useful for LEDs, will not produce the laser effect.*" col. 2, lines 45-49). For example, Edmond provides Group III nitride laser structures on substrates of silicon carbide (col. 3, lines 45-49), i.e., the active layer and the clad are all direct type rather than indirect type of the present invention.

The Isshiki reference is an article of the present inventor, Mr. Isshiki and he declares that the contents of reference did not relate to indirect semiconductor laser. A signed declaration by Mr. Isshiki will be provided upon request. As indicated by the Examiner, the Isshiki reference merely discloses an indirect bandgap semiconductor material for photoluminescence (p. 1048, left col. lines 1-3 & 31-32; Fig. 1; Abstract). However, it does not disclose any indirect semiconductor laser. Isshiki, at most, uses a cw HE-Cd laser (325nm) as an exciton (excitation) source for photoluminescence (p, 1049, left col. lines 2-3

from the bottom), but not to use an indirect bandgap semiconductor material to provide indirect bandgap semiconductor laser. In view of the teachings of Edmond, one skilled in the art simply would NOT be motivated to use Isshiki's indirect bandgap semiconductor material for an indirect semiconductor laser.

As mentioned, Yoshida only mentions "an indirect transition semiconductor (p. 4, [0041])," but not any "asymmetric quantum structure" having "one asymmetric quantum well with two walls on each band" as the present invention. The other cited references also fail to compensate for the deficiencies as discussed above. All of the cited references concerns direct semiconductor lasers and there is no description of the indirect semiconductor laser.

Regarding the (2) feature, the cited prior art references are silent in this regard.

Applicants respectfully contend that none of the cited references or their combinations teaches or suggests the features recited in the independent claim 1 and new claim 22 as the present invention. As such, the present invention as now claimed is distinguishable and thereby allowable over the rejections raised in the Office Action. The withdrawal of the outstanding prior art rejections is in order, and is respectfully solicited.

Conclusion

In view of all the above, Applicant respectfully submits that certain clear and distinct differences as discussed exist between the present invention as now claimed and the prior art references upon which the rejections in the Office Action rely. These differences are more than sufficient that the present invention as now claimed would not have been anticipated nor rendered obvious given the prior art. Rather, the present invention as a whole is distinguishable, and thereby allowable over the prior art.

Favorable reconsideration of this application as amended is respectfully solicited. Should there be any outstanding issues requiring discussion that would further the prosecution and allowance of the above-captioned application, the Examiner is invited to contact the Applicant's undersigned representative at the address and phone number indicated below.

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